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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,327	10/03/2003	Kazuhito Hatoh	10059-474US (P31840-01)	2552
570	7590	09/07/2006	EXAMINER	
AKIN GUMP STRAUSS HAUER & FELD L.L.P. ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			ECHELMMEYER, ALIX ELIZABETH	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/678,327	Applicant(s) HATOH ET AL.	
	Examiner Alix Elizabeth Echelmeyer	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10-3-03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-6, drawn to a fuel cell, classified in class 429, subclass 35.
 - II. Claims 7-10, drawn to a method of operating a fuel cell, classified in class 429, subclass 13.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case, the method of operating contains limitations not required by the product, for example, the pressure of fuel required in the operating claims of Invention II is not found in the product claims of Invention I.

3. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

4. A telephone call was made to William Schwarze (215) 965-1270 on August 23, 2006 to request an oral election to the above restriction requirement, but did not result

in an election being made. On September 1, 2006, a telephonic election of Group I was made.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Watkins et al. (US Patent 5,108,849).

Watkins et al. teach flow field plates for use as the anode and cathode plates in solid polymer electrolyte fuel cells (abstract; column 2 lines 25-26). Watkins et al. further teach that the channels can be rounded (column 5 lines 1-6).

Regarding claim 1, Watkins et al. teach that the most preferable channel width is 0.050 in, or 1.27 mm (column 5 lines 20-25). The most preferable channel depth is 0.050 in, or 1.27 mm (column 5 lines 33-37). Based on these dimensions, a rounded channel would have an equivalent diameter of 1.27 mm.

As for claim 2, Watkins et al. teach channel depths of 0.030 in, or 0.762 mm to 0.150 in., overlapping the range of the instant application.

As for claim 4, Watkins et al. teach various acceptable land widths (column 5 lines 26-32). Calculation of the ratio of land width to channel width, or c/a in the claims, yields a range of $1/24$ - $1/0.15$ as taught by Watkins et al. The range of Watkins et al. overlaps the range of the instant application.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watkins et al.

The teachings of Watkins et al. as discussed above are incorporated herein.

Watkins et al. teach the flow field plate having the limitations required by claim 1 of the instant application. As seen in Figures 2 and 4, the channels are arranged in a serpentine pattern on the flow field plate.

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Watkins et al. fail to teach the ratio, a/b , of the length of the horizontal parts of the serpentine channels to the shortest linear distance from the most upstream side of the horizontal part to the most downstream part of the horizontal parts.

Based on Figure 2 of Watkins et al., it would have been obvious to one having ordinary skill in the art at the time of the invention to make the flow field square, perhaps to maximize the available space in the anode or cathode plate. A square flow field having serpentine channels such as those shown in Figure 2 would have $a = b$, which would result in a ratio of b/a of 1.

12. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watkins et al. as applied to claim 1 above and in further view of Uchida et al. (US Pre-Grant Publication 2003/0175579).

The teachings of Watkins et al. as discussed above are incorporated herein.

Watkins et al. teach a fuel cell having anode and cathode plates with flow fields as required by claim 1 of the instant application.

Watkins et al. fail to teach gas diffusion and catalyst reaction layers having the limitations of the instant invention.

Uchida et al. teach a fuel cell having improved performance because the catalyst and gas diffusion layers disclosed aid in the reaction of fluids with the catalyst (abstract).

Regarding claim 5, the permeable gas diffusion layer has a thickness of 250 μ m to 400 μ m ([0121]). The catalyst layer is coated on the gas diffusion layer ([0004]).

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As for claim 6, Uchida et al. teach that the gas diffusion layer may be made of carbon cloth ([0076]). In the specification of the instant invention, carbon cloth is named in one of the examples as an acceptable gas diffusion layer (page 17 of the specification of the instant application). As such, carbon cloth would inherently meet the limitations required in claim 6 since it is the identical material to that named in the specification.

Using the gas diffusion layer with catalyst of Uchida et al. in the fuel cell of Watkins et al. would be advantageous since the combination would create a fuel cell having improved performance.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the gas diffusion layer with catalyst of Uchida et al. in the fuel cell of Watkins et al. in order to improve the performance of the system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GREGG CANTELMO
PRIMARY EXAMINER

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1745

aee

Handwritten signature of Gregg Cantelmo in cursive script.